

DATA BRIEF

Doctorate Awards Declining in Some Science and Engineering Fields

by Susan T. Hill

Some broad S&E fields have been experiencing declines in doctorate awards.

In 1997, for the first time in almost 20 years, total doctorate awards in science and engineering (S&E) did not increase. After reaching an all-time high in 1996 (27,230), the number of S&E doctorate awards was slightly lower in 1997 (26,847). Although a 1-year decrease is not sufficient evidence for determining if this is a new trend, some broad S&E fields have been experiencing declines in doctorate awards for the past several years.

In several science fields, the number of doctorate awards has been declining since 1994. From 1994-97, doctorate awards in agriculture dropped 10 percent and those in the physical sciences 7 percent. Among the physical science subfields, physics doctorate awards declined 11 percent and chemistry 6 percent; however, awards in astronomy, a smaller subfield, increased (table 1).

In the broad fields of mathematics and computer sciences, doctorate awards declined

Table 1. Changes in selected science fields, 1994-97

| Field/subfield | 1994 | 1995 | 1996 | 1997 | Percent change 1994-97 | Percent change 1995-97 |
|------------------------|-------|-------|-------|-------|------------------------|------------------------|
| Agriculture..... | 1,078 | 1,036 | 1,037 | 966 | -10 | -7 |
| Physical sciences..... | 3,977 | 3,841 | 3,838 | 3,711 | -7 | -3 |
| Physics..... | 1,548 | 1,479 | 1,485 | 1,379 | -11 | -7 |
| Chemistry..... | 2,257 | 2,162 | 2,148 | 2,115 | -6 | -2 |
| Astronomy*..... | 144 | 173 | 192 | 197 | 37 | 14 |
| Other*..... | 28 | 27 | 13 | 20 | -29 | -26 |
| Mathematics..... | 1,118 | 1,190 | 1,122 | 1,112 | -1 | -7 |
| Computer science..... | 903 | 997 | 921 | 889 | -2 | -11 |

*Because the numbers of doctorate awards in these fields are quite small, the corresponding percent changes should be interpreted with caution.

SOURCE: National Science Foundation/Division of Science Resources Studies, *Science and Engineering Doctorate Awards, 1997* NSF 99-323 (Arlington, VA 1999)

between 1995 and 1997, after reaching all-time record high numbers in 1995. Doctorate awards decreased 7 percent in mathematics and 11 percent in computer sciences.

Engineering experienced an overall decline of 4 percent in doctorate awards between 1996 and 1997. Again, this 1-year decline in awards is insufficient for discerning a trend; however, because engineering graduate enrollment in doctoral institutions has been declining steadily since 1992, further declines in doctorate awards are possible.¹

Two science fields maintained their doctorate awards in 1996 and 1997. Doctorate awards in the biological sciences were stable in 1996 and 1997 at about 5,700; in psychology, overall doctorate awards remained at about 3,500 in both years (table 2). The overall total of doctorate awards in psychology masks a slow decline in awards in clinical psychology since 1993 and a continuing increase in awards in nonclinical psychology fields.

The only major S&E field that has continued to increase is the social sciences, which reached a record high of 4,049 doctorate awards in 1997. However, the increases in this broad field have grown smaller since 1994.

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¹ National Science Foundation, Division of Science Resources Studies, Survey of Graduate Students and Postdoctorates in Science and Engineering, 1997, table C-6.

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Doctorate Awards Declining in Some Science and Engineering Fields —Page 2

Table 2. Science and engineering doctorates awarded, by major field: 1988-97

| Field of study | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 |
|---|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Science and engineering, total..... | 20,932 | 21,732 | 22,868 | 24,023 | 24,675 | 25,443 | 26,205 | 26,535 | 27,230 | 26,847 |
| Engineering, total..... | 4,187 | 4,543 | 4,894 | 5,214 | 5,438 | 5,698 | 5,822 | 6,008 | 6,305 | 6,052 |
| Aeronautical/astronautical..... | 150 | 178 | 192 | 207 | 234 | 228 | 230 | 252 | 287 | 272 |
| Chemical..... | 685 | 712 | 658 | 691 | 725 | 737 | 725 | 708 | 798 | 764 |
| Civil..... | 531 | 538 | 553 | 575 | 594 | 624 | 684 | 656 | 697 | 653 |
| Electrical..... | 1,010 | 1,137 | 1,276 | 1,405 | 1,483 | 1,543 | 1,673 | 1,731 | 1,740 | 1,695 |
| Industrial..... | 127 | 162 | 151 | 165 | 196 | 236 | 228 | 284 | 258 | 241 |
| Materials/metallurgical..... | 374 | 380 | 440 | 489 | 485 | 535 | 539 | 588 | 572 | 573 |
| Mechanical..... | 715 | 760 | 884 | 875 | 987 | 1,030 | 1,015 | 1,025 | 1,052 | 1,010 |
| Other engineering..... | 595 | 676 | 740 | 807 | 734 | 765 | 728 | 764 | 901 | 844 |
| Sciences, total..... | 16,745 | 17,189 | 17,974 | 18,809 | 19,237 | 19,745 | 20,383 | 20,527 | 20,925 | 20,795 |
| Physical sciences, total..... | 3,350 | 3,261 | 3,524 | 3,626 | 3,781 | 3,699 | 3,977 | 3,841 | 3,838 | 3,711 |
| Astronomy..... | 130 | 113 | 128 | 125 | 134 | 145 | 144 | 173 | 192 | 197 |
| Chemistry..... | 2,015 | 1,970 | 2,100 | 2,194 | 2,214 | 2,137 | 2,257 | 2,162 | 2,148 | 2,115 |
| Physics..... | 1,172 | 1,161 | 1,265 | 1,286 | 1,403 | 1,399 | 1,548 | 1,479 | 1,485 | 1,379 |
| Other physical sciences..... | 33 | 17 | 31 | 21 | 30 | 18 | 28 | 27 | 13 | 20 |
| Earth, atmospheric, and ocean sciences..... | 695 | 723 | 738 | 815 | 794 | 771 | 824 | 780 | 794 | 862 |
| Mathematics..... | 749 | 859 | 892 | 1,039 | 1,058 | 1,146 | 1,118 | 1,190 | 1,122 | 1,112 |
| Computer sciences..... | 515 | 612 | 705 | 800 | 869 | 880 | 903 | 997 | 921 | 889 |
| Biological sciences..... | 4,111 | 4,116 | 4,328 | 4,650 | 4,799 | 5,092 | 5,203 | 5,376 | 5,723 | 5,717 |
| Agricultural sciences..... | 1,015 | 1,086 | 1,174 | 1,073 | 1,063 | 968 | 1,078 | 1,036 | 1,037 | 966 |
| Psychology..... | 3,074 | 3,208 | 3,281 | 3,250 | 3,263 | 3,420 | 3,379 | 3,429 | 3,491 | 3,489 |
| Social sciences..... | 3,236 | 3,324 | 3,332 | 3,556 | 3,610 | 3,769 | 3,901 | 3,878 | 3,999 | 4,049 |
| Non-S&E, total..... | 12,568 | 12,595 | 13,199 | 13,511 | 14,215 | 14,358 | 14,829 | 15,208 | 15,185 | 15,858 |
| Health..... | 882 | 974 | 956 | 1,041 | 1,112 | 1,197 | 1,296 | 1,330 | 1,324 | 1,394 |
| Humanities 1/..... | 3,274 | 3,242 | 3,535 | 3,720 | 4,036 | 4,092 | 4,374 | 4,690 | 4,713 | 4,996 |
| Education..... | 6,362 | 6,281 | 6,510 | 6,454 | 6,677 | 6,689 | 6,708 | 6,649 | 6,772 | 6,497 |
| Professional/other..... | 2,050 | 2,098 | 2,198 | 2,296 | 2,390 | 2,380 | 2,451 | 2,539 | 2,376 | 2,971 |
| Grand total, all fields..... | 33,500 | 34,327 | 36,067 | 37,534 | 38,890 | 39,801 | 41,034 | 41,743 | 42,415 | 42,705 |

1/ Categories differ from those published by other Federal sponsors and the Summary Reports in that linguistics, history of science, American studies, and archaeology are included not in humanities but in social sciences.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Earned Doctorates

NSF 99-339

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